

Maths In The Pipeline

*A day of maths applications in the oil and gas industry
for school pupils – age 15 years*

EVALUATION OF EVENT

Friday February 5th 2010

Organised by TechFest-SetPoint

Sponsored by OPITO – The Oil & Gas Academy



The winning team 'Cleeton' – with a pupil from each of:
Charleston Academy, Glen Urquhart Academy,
Inverness High School, Inverness Royal Academy, Millburn Academy,
Nairn Academy



MATHS IN THE PIPELINE



Sponsors

Hosts: UHI Millenium Institute, Executive Office

Organisers

PROGRAMME - FRIDAY FEBRUARY 5TH 2010

09:15 Registration

09:20 Welcome ----- *Vivien Ellins, TechFest-SetPoint*

09:30 Introduction of Mentors

09:35 Introduction to the Captain Field ---- *Martin Ellins, KCA Deutag
UK Operations Manager*

10:00 Journey to the Centre of the Earth--- *Rob Hickling, BP
Commercial Manager*

10:45 Morning break

11:05 The Highs and Lows of Forecasting--- *Tom Nelson, Marathon
Process Engineer*

11:55 'Plight of the Navigator' ----- *Lisa Osborne, BP
Process Engineer*

12:35 Lunch

13:15 Business Challenge ----- *Rob & Lisa*

14:15 Challenge solutions & presentations-- *Student Teams*

15:10 Awards of prizes and certificates----- *Maureen Traquair, OPITO*

15:30 Close

*Mentor:
Jonathon Anthony, Wood Group
Mechanical Engineer*



MATHS IN THE PIPELINE



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Hosts: UHI Millenium Institute, Executive Office

Organisers

Maths In The Pipeline has been designed with industry professionals to give S4 pupils the opportunity to apply their mathematical knowledge to everyday problems that occur in the oil and gas industry.

Participating Schools:

- Charleston Academy
- Culloden Academy
- Inverness High School
- Inverness Royal Academy
- Millburn Academy
- Fortrose Academy
- Glen Urquhart Academy
- Invergordon Academy
- Kingussie Hioh School
- Nairn Academy

Teams:

6 pupils from different schools make up todays 9 teams. With the exception of Captain, the teams are named after BP Oilfields:

- Andrew
- Bruce
- Clair
- Cleeton
- Foinaven
- Harding
- Magnus
- Mungo
- Schiehallion

Industry Professionals:

The delivery team involved with todays workshops represent:

- BP
- KCA Deutag
- Marathon
- STEM Ambassadors
- Wood Group

Industry Sponsors:

With thanks today to OPITO - The Oil & Gas Academy, for sponsoring 'Maths In The Pipeline' today.

Our hosts:

With thanks to UHI Millenium Institute, Executive Office for hosting 'Maths In The Pipeline' today.

MATHS IN THE PIPELINE – INVERNESS 2010

SUMMARY OF EVALUATIONS

With 54 pupils from 10 schools and 10 teachers taking part:

INTRODUCTION and MORNING WORKSHOPS

Those present were asked ‘How informative and engaging?’ they found each of the introductory presentation and the 3 morning workshops.

With a rating were 1=Not at all and 4= A lot:

For 3 of the 4 morning sessions, between 70% and 80% of the pupils gave these the top ratings of 3 and 4.

One workshop was deemed more difficult by the pupils and whilst some commented:

Made sense; Well explained; I understood it well; Enjoyable; Fun; Cool; Good activity;

others commented:

It was challenging; Hard to find the answer; Finding the volume wasn't that easy;

The teachers all gave each presentation the top ratings of 3 and 4.

BUSINESS CHALLENGE

When asked “How well do you think your team coped with the Business Challenge?”

78% of the pupils gave this the top ratings of 3 and 4

With the question referring to the pupil teams

100% of the teachers gave this the top ratings of 3 and 4

One commented:

Excellent activity. Pupils were motivated and on task. They presented well and displayed a clear understanding of their proposals. Super team work.

APPLICATION OF MATHS

On the extent their understanding of “how maths is applied in the oil and gas industry has increased

83% of pupils gave this the top rating of 3 or 4

Typical comments are:

I didn't know anything before; I learnt a lot as I knew next to nothing before;

100% of teachers gave this the top rating of 3 or 4. One commented:

An area we do not do enough of in schools. Will try to adopt the ideas of the day and use in the classroom.

MATHS IN THE PIPELINE – INVERNESS 2010

SUMMARY OF EVALUATIONS

CAREERS AWARENESS

When asked “To what extent has today's event raised your awareness of careers within the oil and gas industry?”

69% of pupils gave this the top rating of 3 or 4 with comments including:

No idea before I came. I thought it was only dirty work.

I would now consider a career in oil and gas industry.

INDUSTRY KNOWLEDGE

When asked “To what extent has your knowledge of the oil and gas industry increased today?”

89% of pupils gave this the top rating of 3 or 4 with comments including:

I knew very little about it, didn't know there was so many in the North Sea.

It has showed me a lot of new career opportunities.

100% of teachers gave this the top rating of 3 or 4

with comments including:

Knew very little, enjoyed looking at the website

WORKING WITH THE INDUSTRY PROFESSIONALS

Five industry professionals presented the workshops and took on the role of mentor during the day.

The pupils found them:

Interesting; Very informative, Intelligent; Always ready to help; Kind;

Very friendly & had all the answers but still challenged you.

They gave us confidence; Were interested in what we did;

The teachers commented:

Invaluable help/assistance for pupils. For self, interesting to listen to and discuss with mentors various aspects of days activities.

SUMMARY OF EVALUATIONS

PERSONAL SKILLS

Pupils were asked to what extent they had developed the following skills during the day:

- Teamworking Skills: 85% of pupils gave this the top rating of 3 or 4
- Communication Skills: 76% of pupils gave this the top rating of 3 or 4
- Problem Solving Skills: 63% of pupils gave this the top rating of 3 or 4
- Presentation Skills: 63% of pupils gave this the top rating of 3 or 4

FINALLY

When asked their opinion on what we should 'keep the same' or 'change' for the benefit of future students generally the consensus was:

From the pupils:

Keep the same: *the layout of the day, the tasks and the business challenge*

Why: *Very well organised; It all went well & came together at the end; It was cool. It was fun.*

Change: *Lunch*

Why: *More variety. Burgers. Better food. Not a good choice. More plain sandwiches.*

From the teachers:

Keep the same: *More or less everything especially the business challenge*

Why: *The morning session was very good - pupils getting used to each other. Afternoon was brilliant. Students worked really well.*

Change: *Important to have group icebreaker!*

Why: *Students very stiff to start with & need to get their voice on table & be more relaxed!*

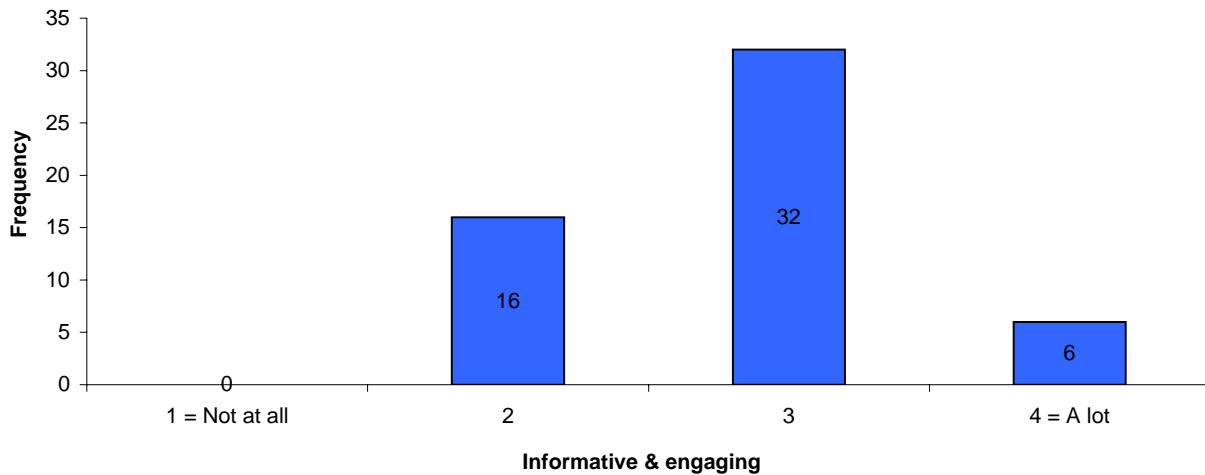
POINTS TO ADDRESS

1. Ice-breaker activity – The planned ice-breaker could not take place as we did not get the number of early arrivals we expected. Next time 2 ice-breakers will be planned, the normal one and a short version which we could use in similar circumstances.
2. Lunch – will source larger, plainer sandwiches or rolls next time. Omit the quiche, repeat the sausage rolls.

The Introduction Presentation

Using a scale where 1 = Not at all and 4 = A lot

How informative and engaging did you find
'The Introduction to the Captain Field'?



Everything was well explained and easy to understand

A useful introduction to oil and gas

Good overall; Quite intriguing

Informative; Interesting facts; Informative; Interesting facts;

A lot to take in early in the morning.

Images and diagrams helped;

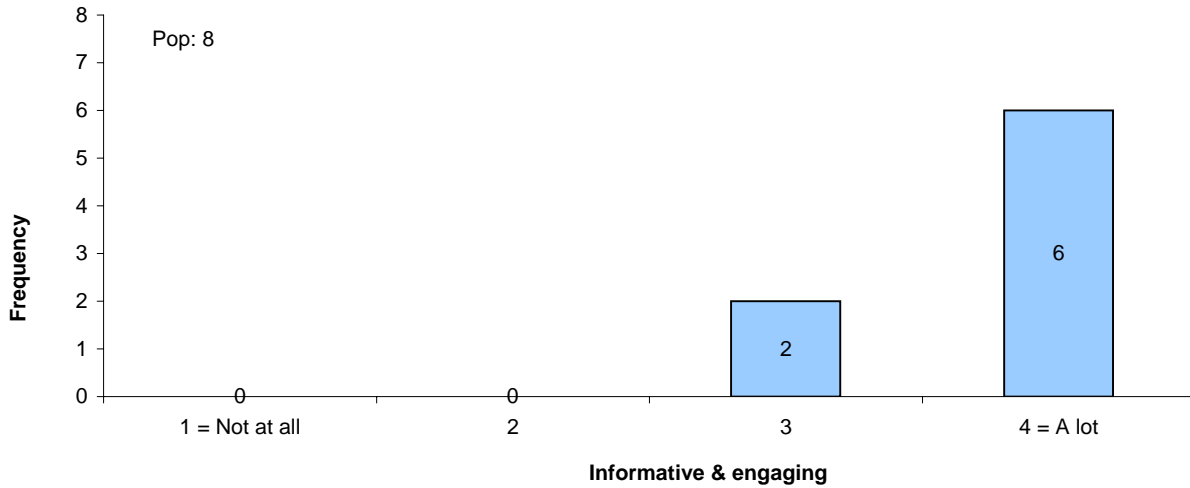
I couldn't see;

More pictures would have been good; Should be a little more Q & A

The Introduction Presentation

Using a scale where 1 = Not at all and 4 = A lot

**How informative and engaging did you find
'The Introduction to the Captain Field'?**



Good talk.

Gave very good information on scale of Oil & Gas Fields

Good intro overall. The language used could be simplified slightly

Interesting background but probably not too motivating for pupils. Language heavy/technical at times.

Audience very quiet, quite self-conscious maybe an ice-breaker would have helped.

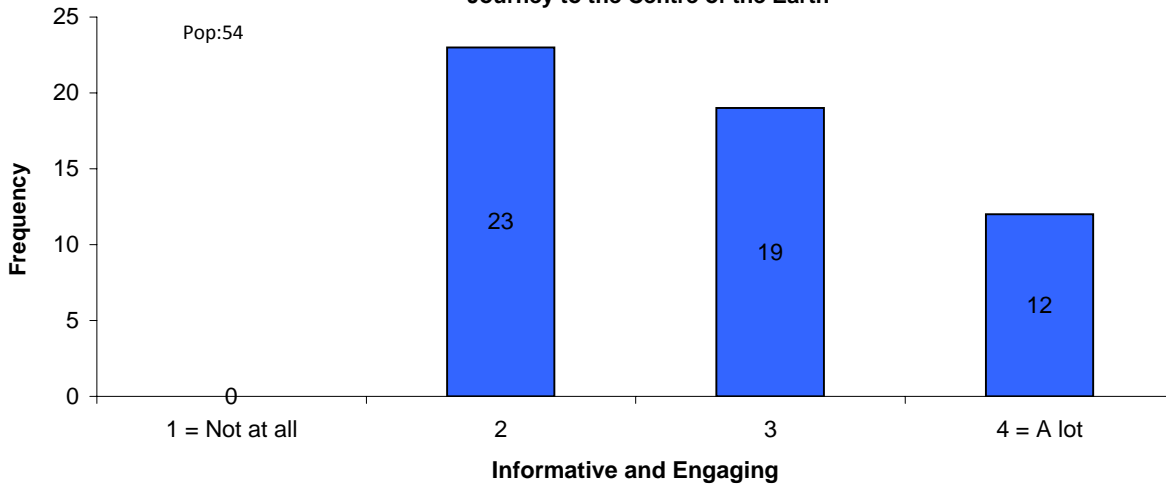
The Morning Workshops

The PUPILS said:

1. Journey to the Centre of the Earth

Using a scale where 1 = Not at all and 4 = A lot

How informative and engaging did you find the
'Journey to the Centre of the Earth'



Got the whole group engaged;

It was good learning how to calculate a large volume

Made sense; Well explained; I understood it well; Enjoyable; Fun; Cool; Good activity;

Very informative; Informative but kinda complicated;

Very interesting; Interesting to know how to estimate the volume; Interesting facts;

It was challenging; Very hard; Hard to find the answer; Quite hard.

Finding the volume wasn't that easy; Quite difficult.

Confusing at first; Complicated.

It taught me about oil storage in the ground; I learnt a lot.

A little boring.

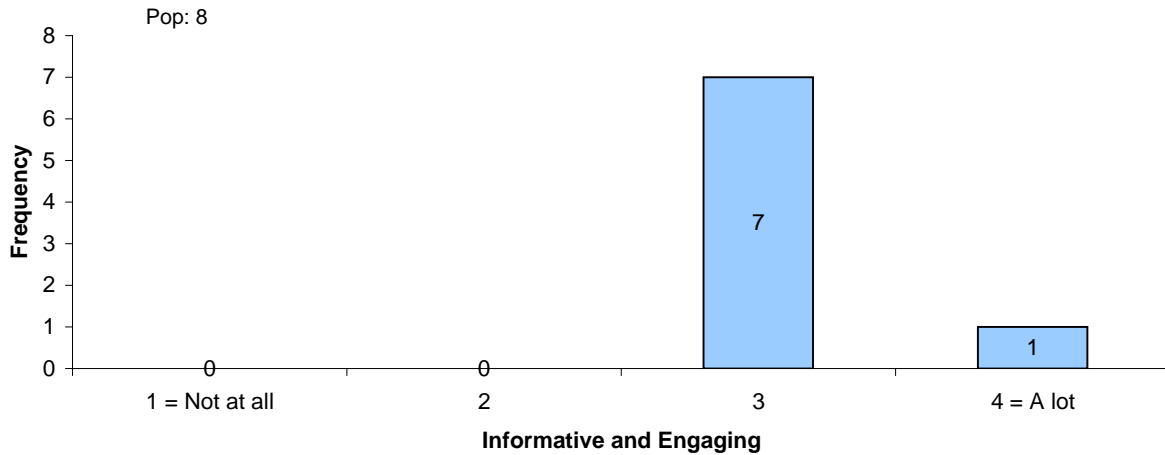
The Morning Workshops

The TEACHERS said:

1. Journey to the Centre of the Earth

Using a scale where 1 = Not at all and 4 = A lot

**How informative and engaging did you find the
'Journey to the Centre of the Earth'**



Very interesting learned a lot

Think pupils found the task daunting - but definitely got into it

A bit slow to get started on activity

Why the graph worked was not explained

GENERAL COMMENTS FOR ALL WORKSHOPS

Excellent ideas - could adapt for schools

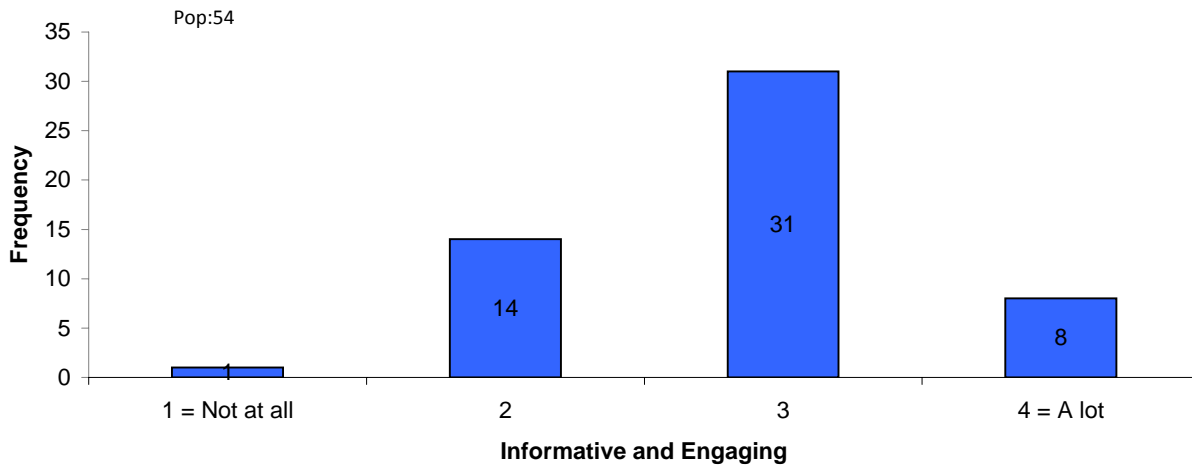
As good as last year

Groups didn't seem to work well together on tasks - maybe need better guidance on working together.

2. Highs and Lows of Forecasting

Using a scale where 1 = Not at all and 4 = A lot

How informative and engaging did you find the 'Journey to the Centre of the Earth'



Good; Fun; Easy; Decent.

It taught about graph plotting; It used my maths knowledge; Don't like graphs.

Interesting; Very interesting & simple; Didn't interest me; Good.

Good because it gives you an idea of when the oil will run out.

Easy but challenging; Nice & easy; Confusing.

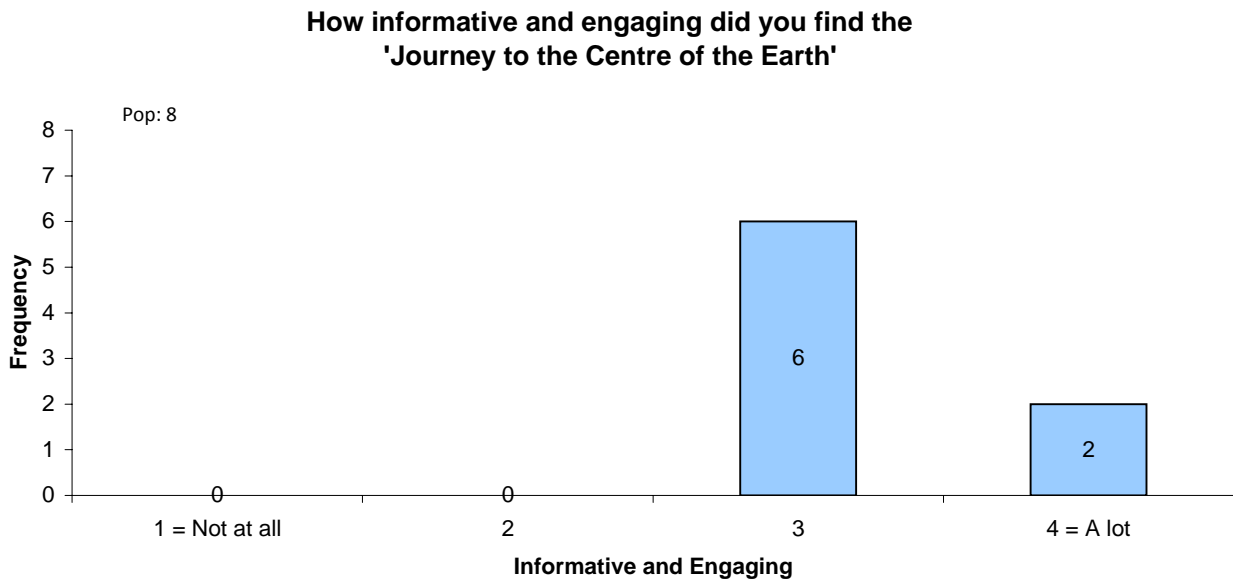
Well explained; not well explained

Didn't do very well.

The TEACHERS said:

2. Highs and Lows of Forecasting

Using a scale where 1 = Not at all and 4 = A lot



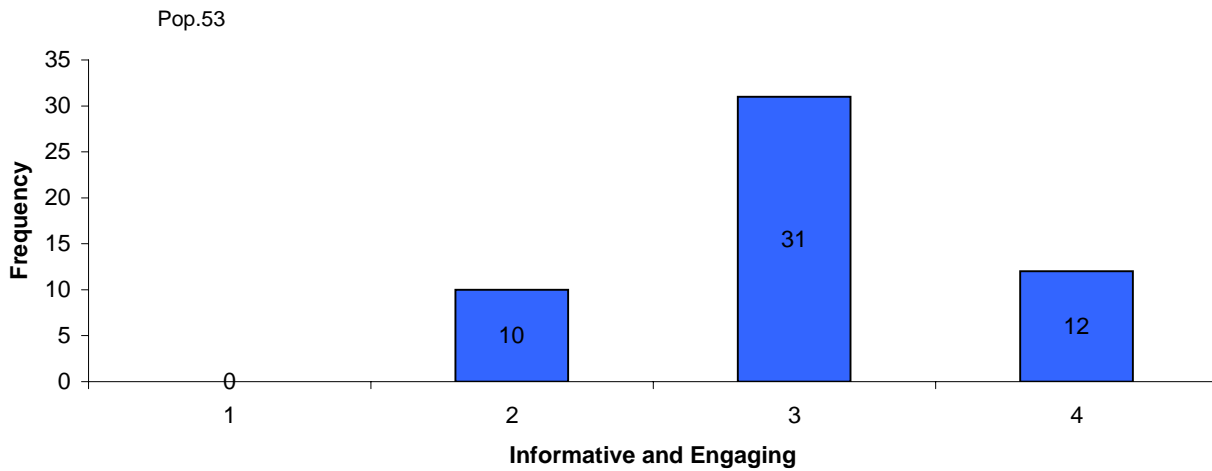
Excellent info on graphs

Excellent for showing real-life application of maths back in school

3. Plight of the Navigator

Using a scale where 1 = Not at all and 4 = A lot

How informative and engaging did you find the 'Journey to the Centre of the Earth'



Algorithm was interesting; New & intriguing; Liked it interesting algorithm

It taught me something I never knew; Best one;

Informative; Good; OK; Quite fun; Interesting; Cool to see.

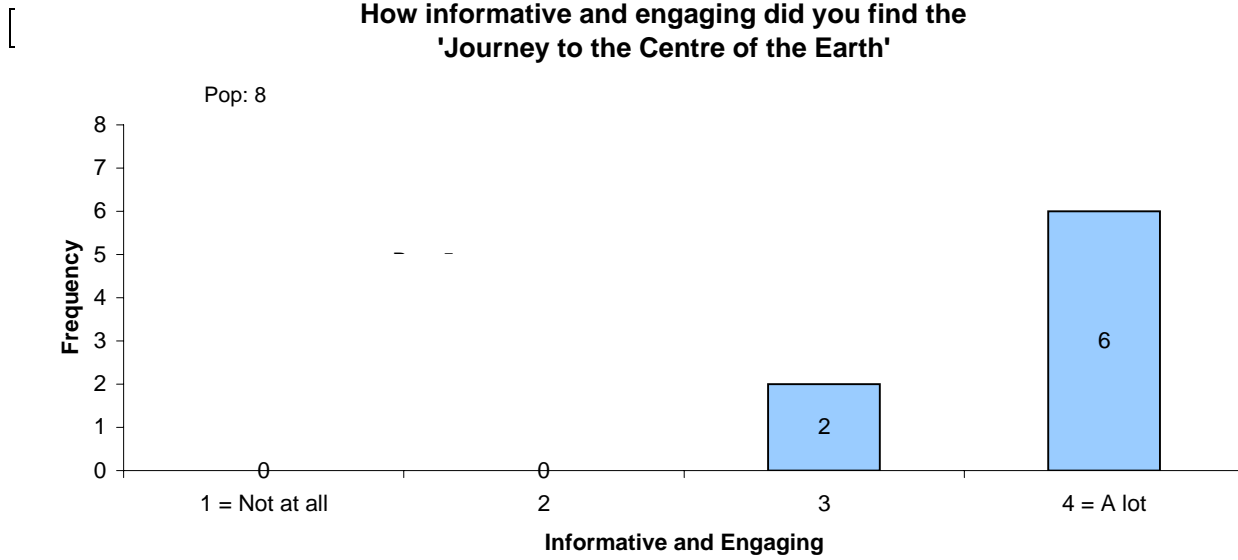
Hard to grasp; Easy but challenging; Hard.

It didn't work; It was a bit unclear, I didn't understand; a bit boring.

The TEACHERS said:

3. Plight of the Navigator

Using a scale where 1 = Not at all and 4 = A lot



Good thinking task

Neat, relevant & clear examples

Easy to understand & relate to

Very clear presentation. Fun to do.

The Business Challenge

Coping with the Business Challenge

Using a scale where 1 = Not at all and 4 = A lot



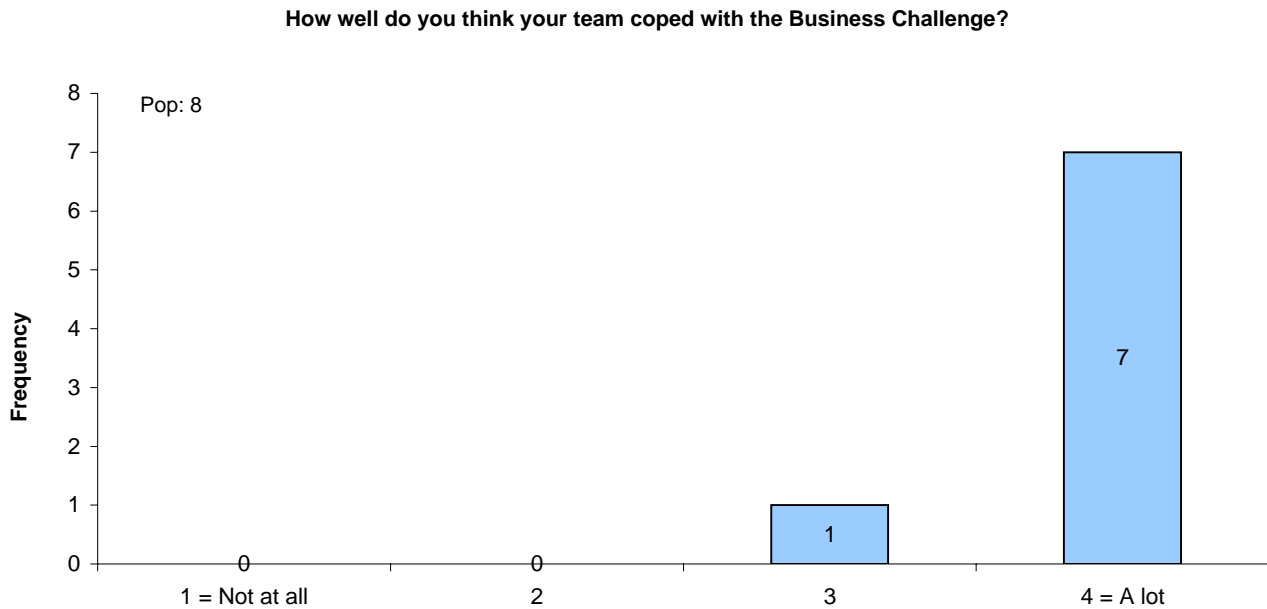
- We worked well together and communicated well.
- We worked well as a team by each of us doing a different task.
- Each were responsible for different parts.
- Worked as a team, all took part and contributed. No problems.
- We worked well as a team with good answers.
- Because we worked together we did well
- We had all the maths right but we struggled with presenting it.
- Most of our calculations were good but I found we presented it poorly
- Our problem solving was good but our presentatin was not as good.
- Working as a team, producing good ideas.
- We tried but not enough time; Not enough time but we felt we did well;
- We were awesome, needed more time;
- We worked well but not enough time;
- Didn't use time well.
- It was a good effort by everyone.

The TEACHERS said:

The Business Challenge

Coping with the Business Challenge

Using a scale where 1 = Not at all and 4 = A lot



Teams really gelled in this task. Presentations were excellent. Amazed at how much they managed to get through in such a short time

Got the groups working together. It's a daunting task to stand up and speak to whole group!

Excellent activity. Pupils were motivated and on task. They presented well and displayed a clear understanding of their proposals. Super team work.

Pupils worked really well together. Particularly liked the presentations. Great to see them all involved.

They seemed to be really engaged, working together which was only done tentatively in the morning

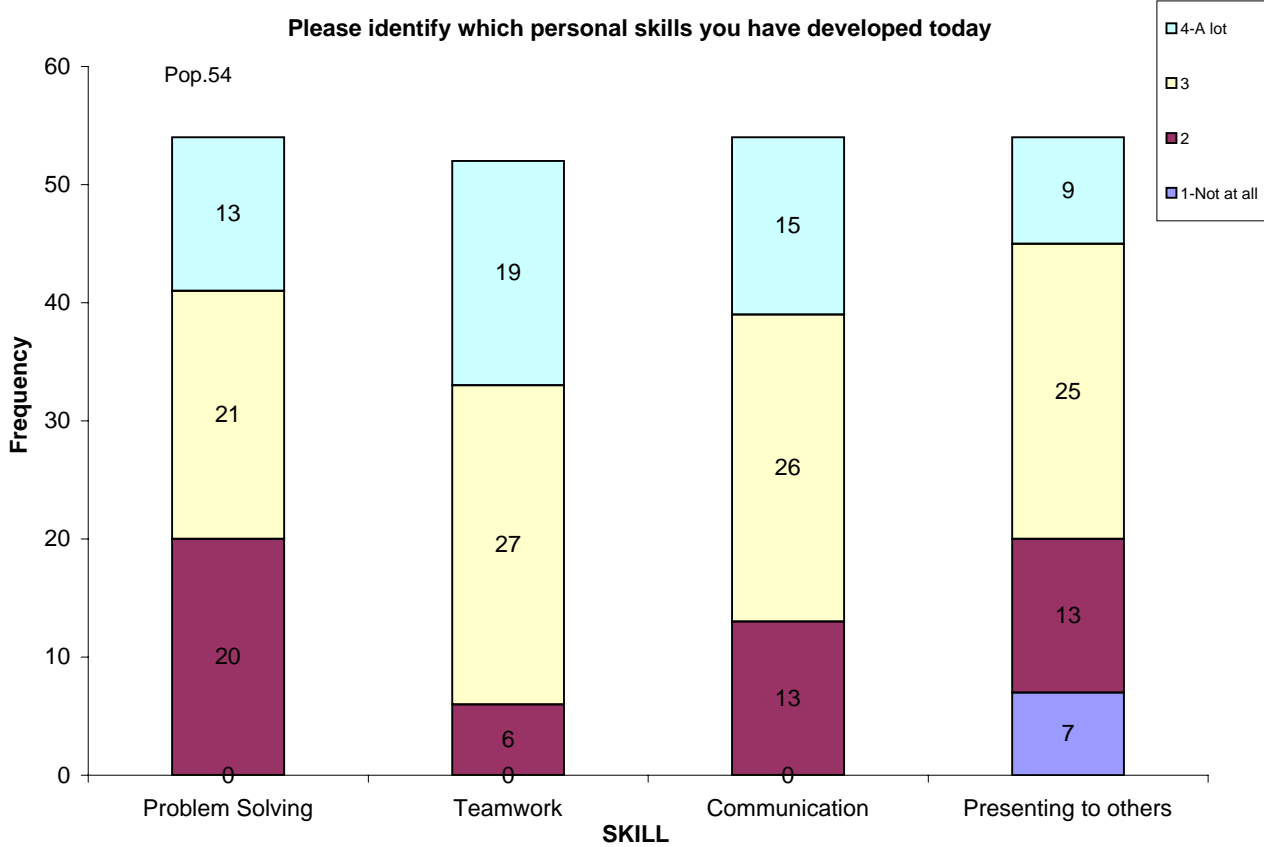
A bit more collaboration and team working within each team would have been good.

The PUPILS said:

MATHS IN THE PIPELINE

Development of Personal Skills

Using a scale where 1 = Not at all and 4 = A lot



The TEACHERS said:

MATHS IN THE PIPELINE

YOUR PUPILS

Please tell us what you think has been significant about how YOUR PUPILS have responded to the experiences of the day.

They enjoyed the day. They felt as if they would not be intelligent enough - compared with peers from other schools - but commented that they were fine!

Great to see them out of their comfort zone. An intensive day but they responded really well. Pupils enjoyed working with others.

Working together, being 'thrown into the deep end' and learning to get on and achieve - an insight into working life.

Very good opportunity to meet and work with people they don't know. Quiet at first but did get involved

Could see which ones took a leading role in their team. All seemed to enjoy it.

Found it slightly difficult to work as a team initially. Maybe an ice-breaker activity would have helped them to feel more comfortable.

Developing problem solving skills

Working with the mentors

In what ways did you find working with the mentors valuable?

They were:

Interesting; Very informative, Intelligent; Always ready to help; Kind;

Very friendly & had all the answers but still challenged you.

They helped you understand. They pointed you in the right direction.

Gave you ideas and made you think about problems; Gave you hints.

They gave us clues to work it out for ourselves;

They gave us confidence; Were interested in what we did;

They helped you develop your ideas; Increased your knowledge.

They were there if you needed help & encouragement

They seem very knowledgeable on their subjects.

They have experience of real-life problems.

You could ask questions whenever you thought of them

Was good to speak to the experts

First hand experience

They showed us how to use maths

The TEACHERS said:

Working with the mentors

In what ways did you find working with the mentors valuable?

Invaluable help/assistance for pupils. For self, interesting to listen to and discuss with mentors various aspects of days activities.

Good for students to speak to people who use maths in the real world

There wasn't a great deal of interaction between teachers and mentors

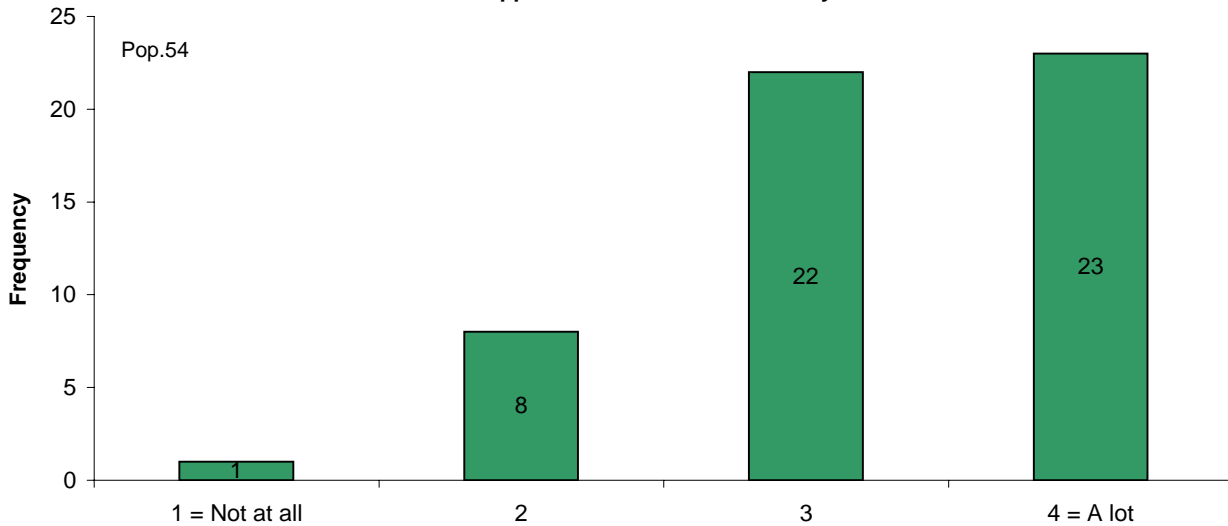
Perhaps more should be made of the " technical" aspect of "growing an oil field". Slides quite hard to see from back of room.

Oil & Gas Industry

Application of Maths

Using a scale where 1 = Not at all and 4 = A lot

To what extent has your understanding of
How Maths is Applied in the Oil & Gas Industry increased?



I didn't know anything before; I learnt a lot as I knew next to nothing before;

Didn't know any of this before I came; Didn't know before so I learnt something today!

Did not know what it was used for or what maths was used.

I now understand that maths is commonly used in all areas of work.

It showed me how much maths is used. It showed me when you use it in real life.

I learned a lot about maths in oil. Maths is needed for all the oil stuff.

I can understand how to apply maths to the industry.

I can see you do need it.

Learnt a lot but I'm sure there is a lot more to learn about the oil industry in terms of maths :)

Simpler methods than expected used. Nothing too difficult or challenging.

Interesting to know where formulas come in. Forecasting really helped.

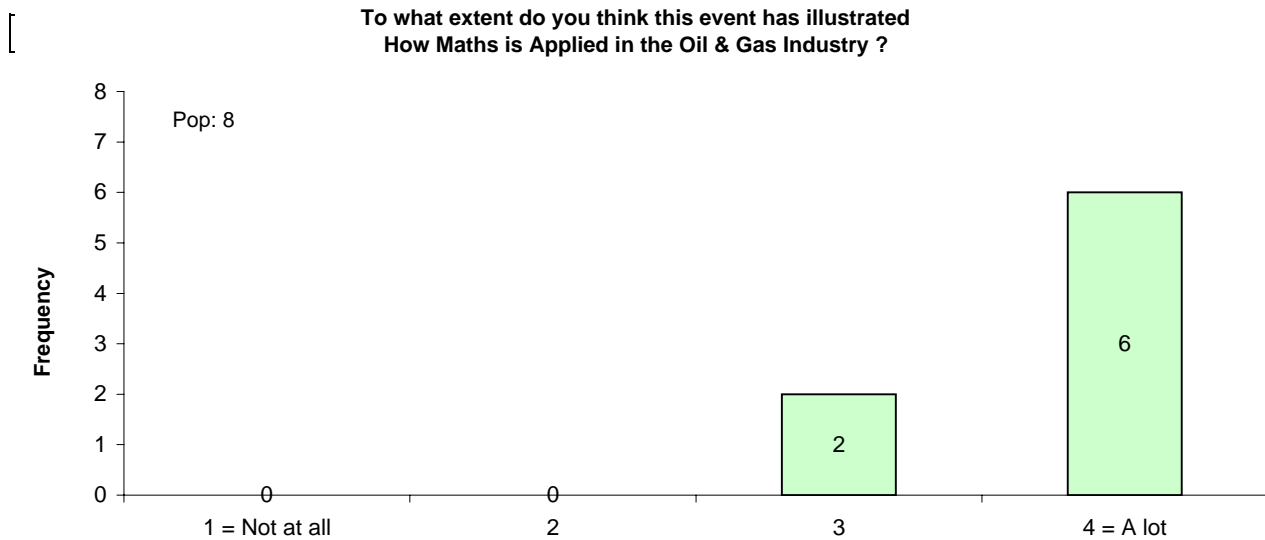
I already knew it was used quite extensively.

The TEACHERS said:

Oil & Gas Industry

Application of Maths

Using a scale where 1 = Not at all and 4 = A lot



Excellent achievable tasks

Numerically intensive, team work, pulling together

An area we do not do enough of in schools. Will try to adopt the ideas of the day and use in the classroom.

Really good to see the application of standard grade work class doing at present time

Some aspects are relevant to current courses - some are good ways to look at problem solving in maths & real life contexts.

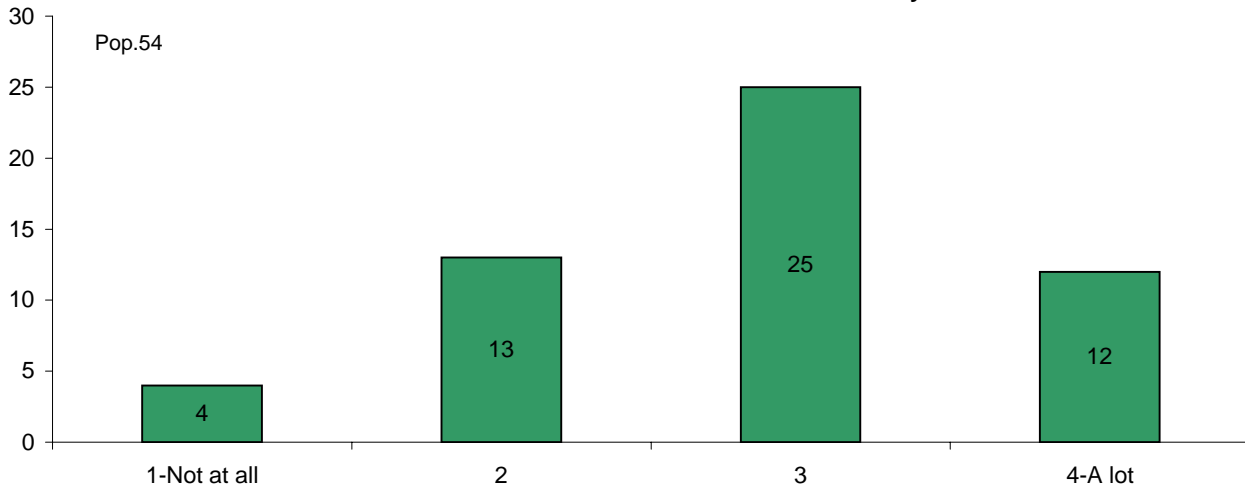
Reasonably well but perhaps a little more input on actual data processing/IT side of things?

The PUPILS said:

Careers awareness

Using a scale where 1 = Not at all and 4 = A lot

To what extent has today's event raised your awareness of Careers within the Oil and Gas industry?



No idea before I came. I thought it was only dirty work.

I would now consider a career in oil and gas industry.

A variety - woman included

There is more maths involved. A lot goes on with maths didn't know it had to be so accurate.

There's a lot of different careers.

Learnt a lot about different jobs in oil & gas industry.

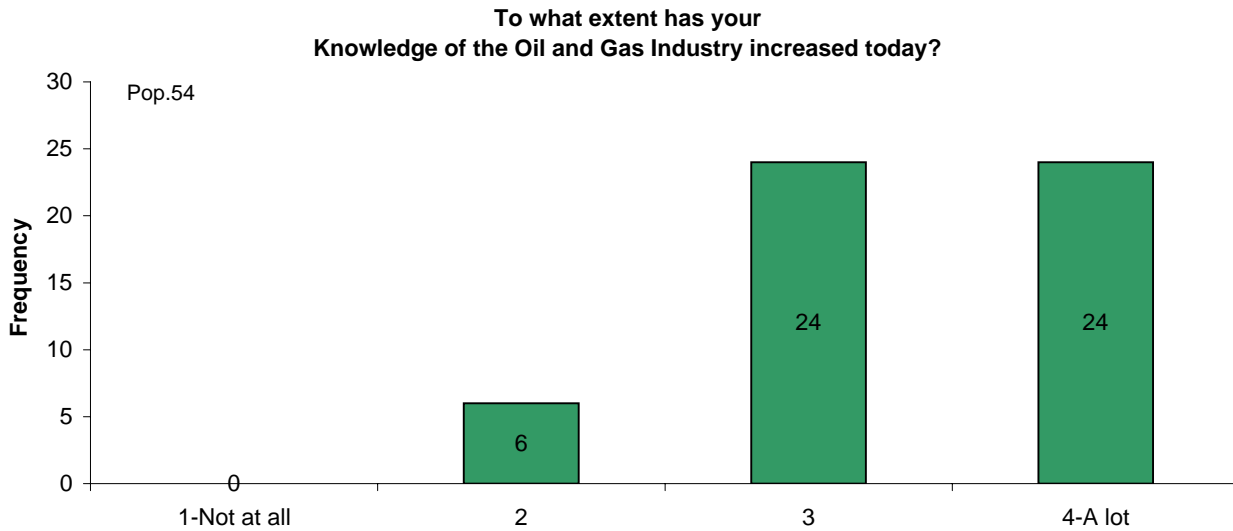
There is a lot of different jobs to do with oil.

Were not told about a large variety of jobs.

Maths In The Pipeline
Evaluation - Inverness 2010

Knowledge of the Industry

Using a scale where 1 = Not at all and 4 = A lot



Didn't know anything before. Everything was new. Knew nothing before.

I have learnt a lot. Didn't know almost anything about oil industry before.

A lot. I never knew anything before. I learned a lot because I knew nothing before.

I know lots more. Didn't know much.

Already had some knowledge. Very interesting.

I knew very little about it, didn't know there was so many in the North Sea.

I understand it more but not well.

It's very complicated.

I have learnt a lot about drilling platforms.

I learned stuff like what a reservoir is

Learned some new facts and how they really extract the oil.

Starting intro was very interesting and it was very informative

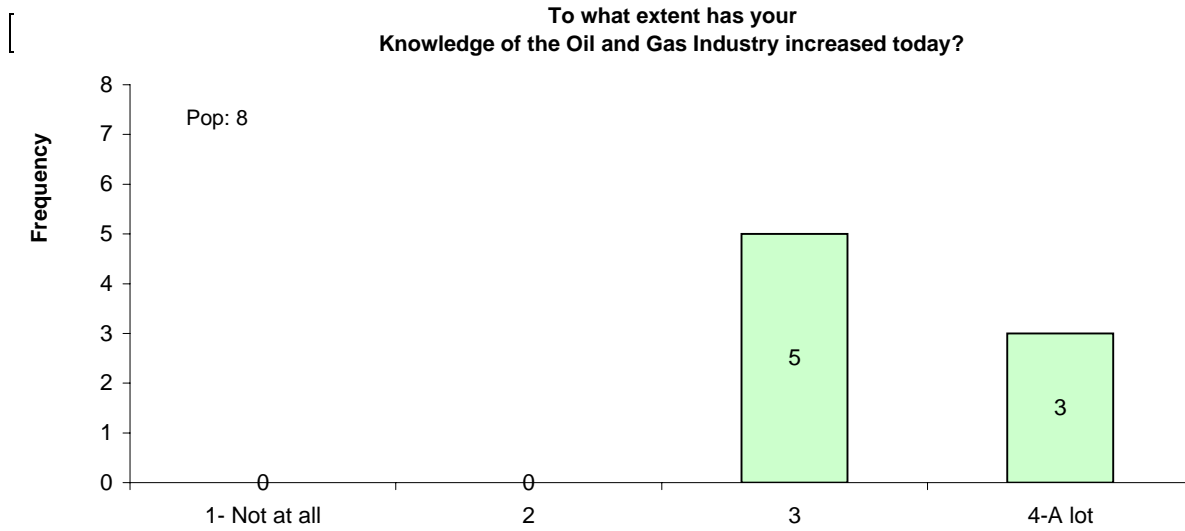
It has showed me a lot of new career opportunities.

It introduced me to a new career.

The TEACHERS said:

Knowledge of the Industry

Using a scale where 1 = Not at all and 4 = A lot



Knew very little, enjoyed looking at the website

Some previous experience of industry! Still very interesting to hear first-hand accounts.

The PUPILS said:

When we do this again what do you think we should KEEP THE SAME and WHY?

KEEP THE SAME	WHY
Yes.	It all went well & came together at the end.
Layout of day & tasks	Very well organised
Buisness challenge	Requires teamwork to keep to schedule.
	A good end to the day.
	It was cool. It was fun.
Presentation at the end	Very challenging and brings together what we've learned
	It was fun & needed communication
Mixed teams	Improves social skills & gives the feel for what entering a job is like. More fun.
The level of maths	It is hard
Mentors. Circulating mentors.	Useful. For questions.
Workshops; Activities	They were informative. Presentations were good. Educational. Interesting. Topical. Fun. Informative.
Everything	It was all good

The TEACHERS said:

When we do this again what do you think we should KEEP THE SAME and WHY?

KEEP THE SAME	WHY
More or less everything especially the business challenge	The morning session was very good - pupils getting used to each other. Afternoon was brilliant. Students worked really well.
Break up of activities & challenge	Good mix of activities
The activities & presentations are well structured	Effective at breaking the day into bitesize chunks
Business challenge definitely should stay. Other group activities also worth keeping	Pupils respond best to Team Challenge activity and presentation etc is really good experience for all
My pet hate is certificates for each pupil. MOST OF THE DAY WAS BRILLIANT ** Thank you	Waste of paper, seldom kept although pupils do seem delighted to receive them so maybe you have won me over. Great to hear the mixture of schools in each team
Ice breaker task?	

The PUPILS said:

What do you think we should CHANGE and WHY?

CHANGE	WHY
Lunch.	More variety. More, I was hungry. Burgers. Better food. Not a good choice. More plain sandwiches.
More time for business challenge	We ran out. Didn't have enough. So we can be sure of ourselves when we present. We ran out. Unprepared.
Workshop length.	Too long. Too short, lots of info crammed in.
Make less difficult	It's hard
Workshops	Need to be harder

The TEACHERS said:

What do you think we should CHANGE and WHY?

CHANGE	WHY
Definitely have an icebreaker to relax teenagers. Longer to produce & practice presentation. Tell them the categories for voting on best.	Maybe some audience participation in voting best presentation but judges decision final one.
Important to have group icebreaker!	Students very stiff to start with & need to get their voice on table & be more relaxed!
Maybe spend more time at beginning emphasising that students should work co-operatively within the group.	Some groups particularly at the beginning werew orking independently of each other.
Groups should have bonding activity	More co-operation in workshop tasks
Try & encourage more inter-team communication and team-working - particulalry at start of day. Maybe reduce the time spent on intro to Captain field.	Tendency for pupils to work in isolation
As a teacher I felt a little out of it! I would have liked to have been placed as an advisor in a team.	If teachers are not "taking part" are they necessary to be there?
Some of the activities could be executed with mentor help but pupils generally found teh difficult to understand.	
Lunch	Pupils were not enthused by the sandwiches. Found mine eating Doritoz.